

REMARKS/ARGUMENTS

Initially, Applicants would like to express their appreciation to the Examiner for the detailed Official Action provided, for acknowledgement of Applicants' Information Disclosure Statement by return of the FORM PTO-1449, for acknowledgement of Applicant's Claim for Priority and receipt of the certified copy of the priority, and for acknowledgement that the drawings are acceptable.

Upon entry of the above amendments claims 1, 2, 4, 5 and 8-10 will have been amended, claim 6 will be canceled (without prejudice or disclaimer of the subject matter contained therein), and claims 11 and 12 will have been added. Claims 1-5 and 7-12 are currently pending. Applicants respectfully request reconsideration of the rejections, and allowance of all the claims pending in the present application.

Applicants acknowledge the finality of the Examiner's restriction requirement, and expressly reserve the right to file one or more divisional applications directed to the non-elected claims.

In the Official Action, the Examiner rejected claims 1-5 and 7-10 under 35 U.S.C. § 112, second paragraph for being indefinite. In particular, the Examiner asserts that it is unclear what is intended by the recitations "adjacently arranged to the compressor" (in claims 1 and 8) and "a drier for removing moisture included in a refrigerant" (in claim 5). Without acquiescing to the propriety of the rejection, claims 1 and 8 have been amended to remove the above-noted recitations, solely to expedite the examination process. In regard to the Examiner's rejection of claim 7, Applicants' respectfully traverse the rejection. In

particular, the Examiner asserts that the recitation of “an electron expansion valve” lacks clarity because it is an idiomatically improper expression. However, contrary to the Examiner’s assertions, Applicants submit that an electron expansion valve is a type of valve, which is readily understood by those skilled in the art. Therefore, the recitation thereof is clear. In further support, please refer to Col. 8, lines 62-64 of U.S. Patent No. 5,211,023 to MATSUURA, in which the inventor discusses a particular use of an “electron expansion valve”. Accordingly, the above-noted rejection is believed to be moot and should be withdrawn.

In the Official Action, the Examiner rejected claims 1 and 2 under 35 U.S.C. § 102(b) as being anticipated by JP 1-300169 (JP ‘169);

Claims 1, 2 and 7-10 under 35 U.S.C. § 102(b) as being anticipated by DUDLEY (U.S. Patent No. 4,766,734);

Claims 1, 2 and 7-9 under 35 U.S.C. § 102(b) as being anticipated by MORITA (U.S. Patent No. 4,798,059); and

Claims 1, 2, 4 and 7-9 under 35 U.S.C. § 102(b) as being anticipated by GERTEIS (U.S. Patent No. 3,293,874).

Although Applicants do not necessarily agree with the Examiner’s rejection of the claims on these grounds, nevertheless, Applicants have amended independent claims 1 and 8 to more clearly obviate the above-noted grounds of rejection, solely in order to expedite prosecution of the present application. In this regard, Applicants note that JP ‘169, DUDLEY, MORITA and GERTEIS, alone or in any proper combination, fail to teach or suggest the combination of elements as recited in amended claim 1. In particular, claim 1, as amended, sets forth an

air conditioner including, inter alia, a refrigerant detouring path that detours a refrigerant discharged from the outdoor heat exchanger to the compressor at the time of a defrosting operation; an outdoor expansion device installed in the middle of the detouring path which reduces a pressure of a refrigerant which flows in the refrigerant detouring path; and a heat exchanging device installed in the middle of the detouring path, which directly exchanges heat between a refrigerant introduced from the outdoor expansion device and a refrigerant discharged from the compressor.

In regard to JP '169, Applicants submit that JP '169 lacks any disclosure of the above-noted combination of elements.

In this regard, the Examiner cites to JP '169 as purportedly disclosing the air conditioner of the present disclosure. In particular, the Examiner takes the position that, in JP '169, the disclosure of an outdoor heat exchanger (26), an indoor heat exchanger (24), a four way valve (23), a compressor (21), an outdoor expansion device (25 or 28), and a heat exchanging device (22) anticipates the above-noted claims. However, contrary to the Examiner's assertions, the elements as disclosed in JP '169 have a very different structural relationship from the elements of the present disclosure. In this regard, Figure 1 of JP '169 illustrates the refrigerant discharged from the outdoor heat exchanger (26) passes through the four-way valve (23) and then directly to the compressor (21). After the refrigerant is discharged from the heat exchanger (26), during the heating/defrosting operation, no further heating takes places prior to the refrigerant returning to the compressor. Thus, JP '169 does not disclose a

refrigerant detouring path which detours a refrigerant discharged from the outdoor heat exchanger to the compressor at the time of a defrosting operation; and a heat exchanging device installed in the middle of the detouring path, which directly exchanges heat between a refrigerant introduced from the outdoor expansion device and a refrigerant discharged from the compressor, as recited in amended claim 1.

In regard to DUDLEY, Applicants submit that DUDLEY lacks any disclosure of the above-noted combination of elements as recited in amended claim 1.

In this regard, the Examiner cites to Figure 1 of DUDLEY as purportedly disclosing the air conditioner of the present disclosure. In particular, the Examiner takes the position that in DUDLEY, the disclosure of an outdoor heat exchanger (18), an indoor heat exchanger (17), a four way valve (15), a compressor (12), an outdoor expansion device (55), a heat exchanging device (30), and an accumulator (27) anticipates the claims. However, contrary to the Examiner's assertions, the elements as disclosed in DUDLEY have a very different structural relationship from the elements of the present disclosure. In this regard, during the defrost cycle disclosed in DUDLEY, the bi-flow valve (21) is shut down and the metering valve (55) is opened. Therefore, during the defrosting operation, DUDLEY discloses the refrigerant flowing from the compressor (12), through the four way valve (15), then passing through the outdoor heat exchanger (18), then through the metering valve (55), and to the heating device (30), before returning to the compressor (see Col. 5, line 63 to

Col. 6, line 18). Therefore, as can be seen from Figure 1 of DUDLEY, the refrigerant exiting the metering valve (55) is the same refrigerant discharged from the compressor (12).

Additionally, the heat exchanging device (30) as disclosed in DUDLEY uses a separately disposed tank (35) to exchange heat with a refrigerant discharged from the outdoor heat exchanger (18). Thus, DUDLEY does not disclose a refrigerant detouring path which detours a refrigerant discharged from the outdoor heat exchanger to the compressor at the time of a defrosting operation; and a heat exchanging device installed in the middle of the detouring path which exchanges heat between a refrigerant introduced from the outdoor expansion device and a refrigerant discharged from the compressor, as recited in amended claim 1.

In regard to MORITA, Applicants submit that MORITA lacks any disclosure of the above-noted combination of elements as recited in amended claim 1.

In this regard, the Examiner cites to Figure 1 of MORITA as purportedly disclosing the air conditioner of the present disclosure. In particular, the Examiner takes the position that, in MORITA, the disclosure of an outdoor heat exchanger (8), an indoor heat exchanger (5), a four way valve (4), a compressor (12), an outdoor expansion device (16), a heat exchanging device (3), and three way valves (6 and 18) anticipate the above-noted claims. However, contrary to the Examiner's assertions, the elements as disclosed in MORITA have a very different structural relationship from the elements of the present disclosure. In this regard, during the defrosting cycle disclosed in MORITA solenoid valves 6

and 18, and fan 14 are shut down. Therefore, while in the defrosting cycle, refrigerant passes from the compressor (1), and through the heat exchanging device (3). The refrigerant then passes through the four-way valve and through the indoor heat exchanger (5). After passing through the indoor heat exchanger (5), the refrigerant passes through the valve (16), and the sections of pipe (15-19), before passing through valve (20). Further, after entering the outdoor heat exchanger (8) the refrigerant is discharged passing again through the four-way valve (4) and the check valve (9), before returning to the compressor. Therefore, after the refrigerant is discharged from the heat exchanger (28), during the defrosting operation, no further heating takes places prior to the refrigerant returning to the compressor (1). Thus, MORITA does not disclose a refrigerant detouring path which detours a refrigerant discharged from the outdoor heat exchanger to the compressor at the time of a defrosting operation; and a heat exchanging device installed in the middle of the detouring path, which directly exchanges heat between a refrigerant introduced from the outdoor expansion device and a refrigerant discharged from the compressor, as recited in amended claim 1.

Additionally, it should be noted that at least one non-limiting feature of the present disclosure is to prevent refrigerant from entering indoors during a defrosting cycle. However, contrary to the present disclosure, MORITA discloses the refrigerant passing through an indoor heat exchanger (5) during the defrosting operation.

In regard to GERTEIS, Applicants submit that GERTEIS lacks any

disclosure of the above-noted combination of elements as recited in amended claim 1.

In this regard, the Examiner cites to Figure 1 of GERTEIS as purportedly disclosing the air conditioner of the present disclosure. In particular, the Examiner takes the position that, in GERTEIS, the disclosure of an outdoor heat exchanger (17), an indoor heat exchanger (22), a four way valve (20), a compressor (13), an outdoor expansion device (30), and a heat exchanging device (23) that includes a detouring path formed as a curved pipe anticipate the above-noted claims. However, contrary to the Examiner's assertions, the elements as disclosed in GERTEIS have a very different structural relationship from the elements of the present disclosure. Initially, Applicants note that GERTEIS does not even appear to disclose a defrosting operation. In this regard, GERTEIS discloses the refrigerant passing through heat exchange coils (17) and (18), and then through expansion valve (30) before entering capillaries (28) and (29). Further, the refrigerant entering heating coil (23) through capillary 29, passes through the valve (20) and back to the compressor (3). Similarly, the refrigerant entering coil (22) through capillary (28) passes back to the compressor via through line (15). Therefore, as can be seen from Figure 1 of GRETEIS, the refrigerant exiting the expansion valve (30) is the same refrigerant discharged from the compressor (3). Thus, DUDLEY does not disclose a refrigerant detouring path which detours a refrigerant discharged from the outdoor heat exchanger to the compressor at the time of a defrosting operation; and a heat exchanging device installed in the middle of the detouring path, which exchanges

heat between a refrigerant introduced from the outdoor expansion device and a refrigerant discharged from the compressor, as recited in amended claim 1.

Additionally, the reheating coil (23) is disposed to reheat the refrigerant before the refrigerant flows into the coil section (22). That is, the reheating coil (23) does not heat exchange between a refrigerant introduced from the outdoor expansion device, and a refrigerant discharged from the compressor, as disclosed in the present disclosure. Further, it appears that the refrigerant is evaporated once again at the coil section (22). Whereas, in an embodiment of the present disclosure, no further heating takes place after the refrigerant passes through the heating device to the compressor.

Applicants' further submit that independent claim 8, as amended, is similar to independent claim 1 in that it recites, inter alia, a refrigerant detouring path, connected to the first refrigerant path by a first three-way valve and connected to the second refrigerant path by a second three-way valve, to detour a refrigerant at the time of a defrosting cycle; an outdoor expansion device installed in the middle of the refrigerant detouring path to lower a pressure of a refrigerant which flows in the refrigerant detouring path; and a heat exchanging device installed between the outdoor expansion device and the second three-way valve, that exchanges heat between a refrigerant discharged from the compressor and a refrigerant which has passed through the outdoor expansion device. Thus, independent claim 8 is allowable for at least reasons similar to claim 1 as noted above. Accordingly, the rejection of claim 8, and claims 9 and 10 dependent therefrom, under 35 U.S.C. § 102(b) is improper for all the above reasons and

withdrawal thereof is respectfully requested.

Absent a disclosure in a single reference of each and every element recited in a claim, a *prima facie* case of anticipation cannot be made under 35 U.S.C. § 102. Since the applied references fail to disclose each and every element recited in independent claims 1 and 8 as well as claims 2-5 and 7-10 dependent therefrom, these claims are not anticipated thereby. Further, all pending dependent claims recite additional features that further define the present invention over the prior art. Accordingly, the Examiner is respectfully requested to withdraw the rejection under 35 U.S.C. § 102 and allow all pending claims in the present application.

In the Official Action, the Examiner rejected claim 5 under 35 U.S.C. § 103(a) as being unpatentable over DUDLEY in view of JP 11-108507 (JP '507).

Applicant respectfully traverses the above noted rejections of claim 5 under 35 U.S.C. § 103(a).

Applicants submit that dependent claim 5 is at least patentable due to its dependency from claim 1 for the reasons noted above. In this regard, Applicants note that the Examiner has provided no explanation or motivation for correcting the above-noted deficiencies in the teachings of DUDLEY. Applicants further submit that JP '507 does not provide any teachings which could reasonably be characterized as curing the above-noted deficiencies in the teachings of DUDLEY. In this regard, Applicants submit that JP '507 does not disclose a refrigerant detouring path that detours a refrigerant discharged from the outdoor heat exchanger to the compressor at the time of a defrosting operation; and a

heat exchanging device installed in the middle of the detouring path to exchange heat between a refrigerant introduced from the outdoor expansion device and a refrigerant discharged from the compressor, as recited in amended claim 1

Applicants' further submit that new independent claim 11, is similar to independent claim 1 in that it recites, inter alia, a refrigerant detouring path that detours a refrigerant discharged from the outdoor heat exchanger to the compressor at the time of a defrosting operation; an outdoor expansion device installed in the middle of the detouring path that reduces a pressure of a refrigerant which flows in the refrigerant detouring path; and a heat exchanging device installed in the middle of the detouring path to directly exchange heat between a refrigerant introduced from the outdoor expansion device and a refrigerant discharged from the compressor. Therefore, claim 11 is allowable for reason at least similar to claim 1. Accordingly, new independent claim 11, and claim 12 dependent therefrom, are also allowable for all the above reasons.

In view of the foregoing, Applicants submit that independent claims 1, 8 and 11 are in condition for allowance. With regard to dependent claims 2-5, 7, 9, 10 and 12, Applicants assert that they are allowable on their own merit, as well as because they depend from independent claims 1, 8 and 11 which Applicants have shown to be allowable.

Thus, it is respectfully submitted that all of the claims in the present application are clearly patentable over the references cited by the Examiner, either alone or in combination, and an indication to such effect is respectfully requested, in due course.

SUMMARY

Applicants submit that the present application is in condition for allowance, and respectfully request an indication to that effect. Applicants have argued the allowability of the claims and pointed out deficiencies of the applied reference. Accordingly, reconsideration of the outstanding Official Action and allowance of the present application and all the claims therein are respectfully requested and is now believed to be appropriate.

Any amendments to the claims which have been made in this amendment, and which have not been specifically noted to overcome a rejection based upon the prior art, should be considered to have been made for a purpose unrelated to patentability, and no estoppel should be deemed to attach thereto.

Should the Examiner have any questions, the Examiner is invited to contact the undersigned at the below-listed telephone number.

Respectfully submitted,
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